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ORIGINAL ARTICLES.

CASTRATION OF THE COW.

PAPER READ BEFORE THE NEW YORK STATE VETERINARY SOCIETY.

BY HUBERT T. FOOTE, D.V.S.

(*Continued from page* 416.)

At a cattle ranch in Wyoming Territory, I practiced ovariotomy on 169 head of cows this past summer.

On the 9th of July I operated on 31 head. This day was bright and clear, temperature over 90° F., and certainly all that could be desired.

Some 35 head of cows which were as nearly dry as could be found, the youngest 18 months old, and the most of them being in the neighborhood of 10 years of age, after being selected from a large herd that had been gathered in the morning, were driven into a corral, or inclosure for holding cattle. I found that the cows under two years of age, numbering four, could not be operated upon, on account of their vagina being too small to admit of the passage of one's hand; they were, therefore, dismissed.

From the corral, some half a dozen of the remaining 31 cows were driven into a chute, (a narrow alley about 18 inches wide at the bottom, and wider above, for the free passage of the animal,) where each received a rectal injection of warm water. After waiting some 15 minutes for them to evacuate their bowels, during which time only two did so and they only partially, each was bound by ropes, and I began operating, first however causing them to expel the injected water, by mechanically starting it with my hand. Let it suffice to say, that the rectal injection of water for the purpose of emptying the bowels was a failure, and I used it in none of my succeeding operations.

The cows, by the time I began operating, had become pretty well excited from having quite a drive in being gathered, and considerable running in being "cut" out from the herd. All, with the exception of one, I think, were with calf, and two, I should judge, were in about the seventh month of gestation. I did not favor operating on pregnant cows, but as it was almost impossible to find any that were not so, I had no alternative.

I met with considerable difficulty in operating on this lot of animals, as they were insecurely bound, and had been maddened by severe clubbing which they had received at the time of binding, so that they struggled in most cases considerably; besides often by compressing their abdomen or trying to lie down, which threw the weight of their hind parts upon a bar placed under the abdomen to keep them from doing so, they would press the internal viscera back into the pelvic cavity. However, I spayed them at the rate of about four an hour, failing to accomplish my object in the two which were so heavy in calf, in these, being able to reach only one ovary; the other on the same side as the cornua in which the calf lay, having been drawn so far forward by the weight of the fœtus, was beyond my reach. In both of these cases I predicted death. After finishing the work, the cows were driven about a mile in all to water and then to pasture. In driving them they seemed to walk a little stiff, with their tails elevated, only one showing any signs of colic and she only slightly.

They all drank well and when liberated in the pasture they immediately went to grazing, having had no water or food since

early morning. Each day they were driven about a third of a mile to water, and after keeping them there a few hours were returned to pasture. Only one of this 31 head of cows died. She was one of the two which were heavy with calf. The fœtal membranes protruded from the vulva on the day after the operation, but the cow seemed to be in no very great distress. On the morning of the second day, I found a live calf at her side, which, judging from its developement, had been carried a little over seven months. The cow that day was suffering considerably, and we were unable to take her again to water. She was found dead on the fourth day succeeding the operation, and was immediately opened. The post-mortem showed very violent inflammation to have occurred throughout the peritoneal membrane, the most dependent portion of which was gangrenous and much thickened by false membranous attachments. The peritoneal cavity contained about five buckets of watery serous effusion without signs of blood. The uterus was highly inflamed and still contained most of the placenta, a small part of which protruded from the vulva. The points of the broad ligament from which the ovaries were detached were included in the general inflammation affecting the peritoneal membrane, but were not gangrenous, and the wound in the vaginal wall had cicatrized. The stomachs and intestines were filled with feed, and the rectum was full of hard nodulated fœces. The chest contained no serum, and the organs there were apparently healthy. The remaining thirty cows were held twelve days and then liberated. None of them, as far as I could discover, had aborted. However, as the grass was very long in many parts of the meadow, abortion might have occurred and passed unnoticed. The symptoms following the operation I will describe later.

Encouraged by the results obtained from the operations on this small number, the parties for whom I was making these experiments desired now that I should operate on a large number. I cautioned them that the operation must be done in warm weather, and to have the animals ready for me before the cold weather set in. This they neglected to do, not having them ready for operation before Sept. 6th.

On that date I operated on 24 head of cows. The weather was cloudy and cold, the thermometer ranging about 55° F.

Sept. 7th, 48 more were subjected to the operation. The weather on this day was colder, if anything, than on the previous day.

Sept. 8th I operated on 48 head more, the day being clearer than the preceding two, but the temperature was about the same.

Sept. 9th I operated on 18 head, making in all 138 cows for these four days. The weather was clear and slightly warmer than on any previous day.

These cows were with few exceptions pregnant, most of them in the first or second month, one being in about the fourth month, and all, excepting two, had sucking calves running at their sides.

The results of the series of operations were by no means as satisfactory as those of the former experiment.

Of those operated on the first day twelve died, making half of the total number; eleven died of the 48 operated upon on the second day; nine of the 48 of the third day, and three of the 18 head upon which I operated on the fourth day. This made 35 head in all, that died.

Of these 21 died with gangrene of the peritoneum, with more or less serous effusion into the abdominal cavity. The inflammation in most cases extended throughout the peritoneal membranes even affecting the visceral layer as well.

The gangrene was generally found in the most dependent portions, and in these parts as a rule, the membrane was much thickened by the attachment of false membrane, and what appeared to be a coaguable reddish albuminous infiltration into its tissue, in many cases reaching the thickness of from $1\frac{1}{2}$ to 2 inches. Where the inflammation was extensively diffused and extended to the vagina, the incision in the upper wall of that organ had not cicatrized. If it had not reached as far, the cicatrization was generally in progress, if not complete. In very few of these cases was the broad ligament, from whence the ovary was taken, gangrenous, and in none of the cases could I see any indications of the inflammation in that part having been the cause of the fatal lesions. In these cases no blood-clots were found in the peritoneal cavity.

It is quite probable that some of these cows died from dispnœa, due to the extensive watery effusion which distended the abdomen of many.

I found seven cases with blood-clots in the abdominal cavity. Of these, three only contained very small clots, which probably were not sufficient to cause a fatal peritonitis. However, the peritoneum was gangrenous in two of the cases, and no doubt this condition was the cause of death. In the third, I am satisfied, having seen the animal die, and observed the amount of serum afterwards found in the abdoman, that dispnœa was the cause of death.

In the remaining four cases was found a widely diffused mass of clotted blood extending all over the lower portion of the abdomen, and strung out to the ovarian cord of one side in two of the cases, and to both of the cords in the other two. Of course these immense clots caused a violent peritonitis, resulting in gangrene. Here hæmorrhage was the primary cause. Three of the remaining cases showed no signs of violent peritonitis, but the uterus in each was highly inflamed and its walls gangrenous. They had all aborted, with apparently pretty well advanced fœtuses, although not beyond the fourth month. The ascites in these cases was slight, and the points from which the ovaries had been taken seemed to have been doing well.

The last four of the thirty-five fatal cases were found in the river which surrounded an island on which the cows were herded. As it was impracticable to open them, the cause of death could not be determined, but my belief is that they went into the water to drink, and in endeavoring to climb the banks, which were four or five feet high, were drowned I opened the thoracic cavity of several of the cadavers, but found no abnormal lesions there. The stomach and bowels were invariably filled with food, and the rectum contained large quantities of hard, dry, impacted fœces.

Of those cows in which I found gangrenous peritonitis without blood-clots, two died on the second day after operating, three on the third, three on the fourth, six on the fifth, three on the sixth, two on the seventh, one on the eighth, and one on the ninth day, making in all twenty-one. Of those that presented

blood clots in the abdomen, two died on the second day after the operation, one on the third, two on the fourth, one on the fifth, and one on the sixth day, making in all seven. The three in which gangrene of the uterus was found, died on the sixth day after operating. As regards those that were found in the river, it makes little difference as to the days, excepting that none were lost in that manner until the third day after the operation.

This was a large mortality, but I think I am able to account for it. These cows were gathered from a distance of seventy-five miles or over, to the ranch, so, many of them had traveled a long distance, of course only in short stages, each day going about ten or twelve miles, but the last day they were driven twenty-five miles, only getting a nip of feed here and there, and on arriving at the ranch were corralled, going all night without food. For the next three or four days they were driven about considerably, getting only little feed and rest; at the same time their calves were branded. This always excites them. These animals are perfectly wild and all handling is done by force. By the time they were ready for operation, their physical condition was run down, and they were excited and feverish. While I was operating on the first day the rest of the cows were grazed and rested, and as the temperature moderated somewhat towards the last, the mortality decreased. The nights succeeding the operations were very severe, blowing a gale and storming the first two, while the last two were scarcely more favorable, excepting that the wind was not so strong. Then again, with only two exceptions, the cows all had calves, which worried them greatly by incessantly sucking and butting at the mammæ, when there could be little or no milk had. The operations were carried on more quickly and smoothly than with the previous lot, passing the animals at the rate of about eight per hour, one reason being that I had had more practice, and another that they were secured more quickly and firmly by means of an apparatus that a cattle owner in Cheyenne had used, having experimented somewhat extensively in the operation through the flank on his own cows. It consisted in a lever working against one side of the chute. It swung on a pivot at the bottom, and glided between two stanchions above. As the cow

would run through the chute, on reaching the lever, and passing her head beyond it, a man with a rope attached to its free extremity would pull it over, grasping the neck of the cow, pressing it against the side of the chute, and so tightly that she could neither pull her head back, or shove forward to any extent. Then, by placing a bar under her abdomen to keep her from lying down, the animal was ready for the operation. Of course she had some slight lateral freedom with her hind parts, but that was unobjectionable. No precaution was taken to keep the cows from kicking me, and only one attempted to do so. Nearly all of them fought pretty hard before we could get them into the lever, consequently receiving a beating in proportion, and with uncalled-for brutality from the ranchmen, many of them suffering the loss of one or both horns, causing them intense pain as they would afterwards manifest. All this, no doubt, added sensibly to the reactional fever, and I noticed that nearly every cow that lost a horn died. During the operations the cows showed no signs of pain or distress until the ovaries were being crushed off, when many of them would arch their backs and flinch slightly, not enough however to evince any acute suffering. After the ovaries were extracted, and before each cow was liberated, she had to be branded with a red hot iron, for the purpose of distinguishing her from the non-castrated cows. When the iron was applied they would often thrash around violently, showing this to be another of the tortures which they had to endure. After being operated upon they were driven about a mile, to a large island in the North Platte River. The pasture was too small to accommodate all, and this was the only means afforded of holding them excepting herding in the day, and corralling at night, which always gives them more or less excitement. To get them to this island they had to wade through water up to their abdomens, and climb a steep embankment about five or six feet high. On the way there they showed no unnatural symptoms with the exceptions of most of them carrying the tail elevated, and a very few showed stiffness in the hind limbs. They drank freely in crossing the water to the island, and immediately went to grazing on reaching it. The symptoms following the operation, are a flexing of the vertebral

column; the animals switch their tails and sometimes have light colics, but these are of short duration. If they cease to eat, drink or ruminate at all, it is only for a short time, and in two or three days they are to all appearances perfectly well. The incision in the vagina heals readily by first intention, and in a few days, owing to the contractility of the tissue of the part.

The complications following the operation are:

1st. Hæmorrhage from the ovarian arteries.

2d. Peritonitis.

3d. Abcess in the pelvic cavity.

4th. Return of the rut.

The first of these is always to be dreaded. I attribute the cause of it, in the four cases which showed extensive blood-clots, to an alteration in the ovarian blood vessels and ligaments. In very old cows such as these were, there is sometimes an excessive friability of these organs, which, predisposed to break easily, are in the worst condition possible to submit to the crushing of the ecraseur, and thus exposes the blood vessels to hæmorrhage, which always results seriously. I noticed a great difference in the amount of force required in crushing off the ovaries in different animals, the attachments being the strongest in the middle aged cows, and being very weak in some of the oldest. If in these cases hæmorrhage is expected the arteries should be ligatured at the time of operating. When the hæmorrhage cannot be accounted for by some abnormal condition of the cord, it is probably due to improper use of the ecraseur. From the lesions found in the other three cows, in which there were slight blood-clots, it is to be inferred that small hæmorrhages are not dangerous. It is probable that in these cases the loss of blood in the animals was due to their having been in rut at the time of operating. During the period of rut the ovaries are highly congested and in consequence predisposed to hæmorrhage.

The peritonitis is the most frequent and serious of the consequences. As its causes, we may enumerate hæmorrhage from the ovarian arteries, exposure of the animal to cold and damp weather, predisposition of the subject, abortion, and lastly the introduction into the abdominal cavity of air far below the temperature to which

the abdominal viscera have ever before been exposed. During the operation the air rushes in and out of the abdomen through the vagina and the incision through its walls, and, at a temperature below 60° F., as it was on the days on which I operated, it must necessarily set up an intense congestion, which rapidly progresses into inflammation. The extensiveness of the peritonitis in nearly all the cadavers that I opened, attacking at the same time the visceral layer as well as the parietal, indicates the cause to a great degree to have been the chilling of this membrane. Most of the cows that died had aborted, but the fœtuses were so young that I lay little stress on this fact and consider it to have been a secondary rather than a primary trouble. I do not regard this operation as dangerous on account of pregnancy, if the fœtus be not more than three or at most four months *in utero*. It may be difficult to reach the ovaries where the pregnancy is approaching the fourth month, but this may be easily ascertained before operating by feeling for them per rectum. None of these cows were over four months in pregnancy, and there was no trouble in securing the ovaries in any of them, but the tension on the broad ligament always endangers the ovary breaking away too quickly and thus causing hæmorrhage, or, from the strain to the membrane in bringing the ovary to a point where the ecraseur can be applied, setting up a severe peritonitis. Though it was impossible to get any reliable statistics of the number of cows that aborted and at the same time recovered, my opinion is that a very small percentage would cover the cases.

The peritonitis always assumes the acute type, and is very rapid in its progress, as is shown by two cows having died from gangrene of the peritoneum on the second day after the operation, while none of the animals showed any unfavorable symptoms on the first morning after, those that I spayed on the first day looking so well the next morning that I did not expect a loss among them, and was encouraged to continue my operations on the remainder. Most of the cows that died from the peritonitis however, suffered much longer than the above two. The first symptoms are, the sudden cessation of milk, the animal becomes greatly depressed, indifferent to all surroundings, shivers, eats and

drinks mechanically, ceases to ruminate, experiences difficulty in locomotion, and the back is arched. She grinds her teeth, sometimes utters plaintive bellows, the belly becomes much distended and signs of colic are frequent. She paws the ground, lashes her tail, stretches her neck and limbs, frequently looks at her side, remains immobile in the standing position, or lies as much as possible on her side, and when disturbed she rises with great difficulty. The look is fixed, sad and anxious. The hair is bristled and the hide bound. The mammæ are collapsed and have a pale yellow color. The respiration is short, quick and stertorous. The fœces are dry, balled, and not abundant, and their evacuation is accompanied with straining. The cow makes frequent attempts at urination, the urine coming away in small quantities, yellow in color and odorous. In all cases the serous effusion is very abundant, and distends the abdomen enormously in some cases. This symptom was probably exaggerated in my experience from the close proximity of water to the cows, and the liberality with which they partook of it. I, unfortunately, was unable to take the pulse and temperatures of the cows in this condition, for it would have necessitated a hard fight with desperate animals to have accomplished it. Gourdon, in speaking of these symptoms, says the ears, drooping, are alternately hot and cold. The body is hot, and the extremities icy. The pulse is sometimes hard, small and wiry, or at other times is full, unequal and quick. When the evil aggravates itself, the pulse becomes more irregular, intermittent and insensible. I inferred a high temperature from the sunken, feverish aspect of the eyes, but was unable to procure any thermometrical calculations. Just prior to death the eyes are dull, face is shrivelled, mouth dry, sadness augments, groans sometimes are uttered, and delirium sets in, the animal dying in great agony.

During the course of the above symptoms, the animals on which I operated sought the sun as much as possible. During the heat of the day they lay around on the hot, dry sand beds, that spread off from one side of the island, at night seeking such seclusion as they might find amongst the small timber on the island.

Abcess in the pelvic cavity. This is a complication that Charlier speaks of, and one which occurred in one of the last of the cows that died from my operations. The animal without doubt died from peritonitis, but I think this had no connection with the abscess. The size of this tumor was about that of an egg, situated in the recto-vaginal wall. On opening it I found a small amount of pus, which would probably have broken its way to the exterior through the vagina or rectum.

Return of the rut. This has been noticed by some of the French experimenters in rare cases. The return of the heat is with great irregularity, taking place one or many months after the operation, but is not periodic as with the non-castrated cows. It lasts but a very short time, some minutes only, in certain cases, but returns then many times in a day. This condition continues some days, and then disappears. I can find no explanation of the cause of this return of the rut, but it has little or no influence, and so is of no particular importance.

Precautions which are advisable for the most perfect results from the operation. The cow should not be in rut. She had best not be in a state of gestation; if she should be, not to exceed the third month. An animal, while in good health, should be spare rather than plethoric. If she should have a sucking calf, she should be deprived of it some time before the operation, so that she may have overcome her anxiety for it, and be at the same time saved from its annoying company. Before operating on a cow she should be deprived of her last meal to lessen the pressure in the abdomen. She should also be thoroughly milked, if she should not be dry. "Her rectum," says Gourdon, "should be evacuated by an injeetion of tepid salt water, and her bladder emptied by titilating the urinator meatus, which immediately causes urination." I have already given you my experience in trying to empty the bowels. I did not endeavor to empty the bladder, and found no inconvenience therefrom, excepting in a few cases causing urination while operating, from irritating the meatus.

It is best to operate in a high temperature; not necessarily hot, but certainly not below 70° F. A pure atmosphere is also

essential. Lastly, secure the cow in a position slightly inclined forward, and I think no better apparatus can be adopted than the one I used.

Care to be observed during the operation.—In the first place, oil your hands and arms thoroughly with sweet oil; then pass one hand into the vagina before inserting the speculum, to see that there are no purulent collections within; such are sometimes found, and are generally due to metro-vaginitis. It is necessary in these cases to thoroughly cleanse the vaginal cavity before operating. Before using the instruments see that they are perfectly clean, and after finishing the operation on one cow, if another is to be operated upon, a tub of clean water should be at hand to throw them into. It is very important to avoid getting the least particle of dirt into the peritoneal cavity, where it would probably produce fatal complications. In making the incision, care must be used not to start it too far back; as then there is danger of injuring the rectum, or becoming embarrassed in the lateral ligaments which descend from that organ. Besides, when the incision is well forward, the hemorrhage is very slight, generally not enough to stain one's fingers, while it is always more extensive the further back the wound is made. This applies also to the incision made away from the median line. The further it is to one side, the more extensive is the hemorrhage, and furthermore leaves more danger of the formation of abcesses.

In some cases the peritoneal coat is detached from the middle coat of the vagina, and one fails to incise it with the same stroke that cuts the rest of the vaginal wall. If this occurs, the air enters under the peritoneum, and distends that membrane forward into the abdominal cavity. Considerable difficulty is now experienced in dividing it, the best plan being to invert the hand containing the knife, and endeavoring to sever it with a forward stroke, using great care, however, not to injure any of the organs against which it now lies. A few cases will be met in which one of the ovaries is the seat of cysts of sundry degenerations, of more or less volume. Caution must be observed in these cases not to break the cyst in the abdomen. Gourdon says: "These cysts occur in cows that have been in heat many times without receiv-

ing the bull," or what he calls "Taurelieres" (cows that are continually in rut, and take the bull, but are sterile). Sometimes yellow bodies are developed in the substance of one of the ovaries, attaining a size that would readily deceive the operator, who, extirpating one, might think it to be the ovary, and thus fail to complete the operation. It comes away very easily, generally by the pressure of the fingers in grasping the ovary to bring it into the vaginal cavity.

I previously mentioned the degenerated condition of the ovarian cord and ligaments that sometimes occur in old cows, and the precautions to be taken when such is suspected. I must now conclude these observations on the care required during the operation, with a warning of the necessity of extracting the whole of the ovary; for the smallest particle of that organ left attached to the ovarian nerves and vessels is sufficient to regenerate, to a certain extent, the ovary, which will then secrete new ovules and thus render the operation useless.

Cares to be observed after the operation.—Gourdon recommends a moderate diet for two or three days. Commencing with the fourth day, increase the diet gradually, until the former rations are reached. Keep the animals from all drafts and changes of temperature. If at pasture, they must be stabled for ten days following the operation, fed with green food, and given water with the chill taken off. If the weather should be fine, they might be let out for a little while each day, and towards convalescence all day, but returned to the stable at night. Unfortunately, these precautions cannot be practised on the Western cattle ranches.

Much, no doubt, may be done towards saving a cow by the aid of medical treatment, when such is possible, and thus further lower the chances of mortality from the operation.

In conclusion, I would state that I see no reason why ovariotomy cannot be performed on cows in this country with as good results as have attended the operation in France. I consider that my experiments, although carried on under very unfavorable circumstances, and attended with a large mortality as a whole, were, to a certain extent, a success. They certainly proved that, even on our cattle ranches in the west, the operation may be performed

during the hot months of June, July and August, and, though unattended with the best precautions and care, with a very slight mortality following. There is no doubt but that the cows would convalesce much quicker if they were turned out at large after the operation, instead of being herded or pastured where they would have to be driven to water every day.

Amongst the western herds, spaying, practiced on the cows before they become too old, unquestionably would prove a great source of economy to the owners, as the old animals give an inferior quality of offspring, which is certainly not to the interest of cattle raisers constantly endeavoring to better the quality of their stock; and, again, a large number of cows are now allowed to bear calves until they are so old that they are carried off by the severe storms of the winter in that country, while those that are sent to market bring only an inferior price, and supply an inferior meat. From this it is readily seen that there is an enormous loss annually from the non-castration of these ranch cows; for these western herds number in the millions; but from the present meagre statistics of cattle in this country, it is impossible to arrive at any approximate figures.

To the farmer the operation would also prove a saving. Such of his cows as are becoming old, by being spayed a year before he intends to dispose of them, would give an increased quantity of milk during the last year, and would bring a higher price when taken to market. It probably would not be to the farmer's advantage to have the operation performed on his young cows for the superior milking qualities derived therefrom, for the calves which the cows in a natural state would annually bring forth, would be of more value to him; unless, of course, he had a ready market for dairy products.

In dairies, the spaying of cows has proved to be of paramount value. Here, the animals giving a largely increased quantity of milk, of superior quality, lasting several years, after which they are of a higher market value, a handsomely increased revenue is afforded to the owners.

In some very carefully figured estimates, compiled by Mons. Charlier about a quarter of a century ago, he showed the annual

loss to the live stock interest in France, from the non-castration of the cows, to amount to over 140 millions of francs, equal to about 28 millions of dollars. The number of cows then butchered annually in that country was about 800,000. This number he divided into the percentages that were Taurelieres, and those that were fattened in each of the several different manners, and then estimated the loss on the animals in each class as they dressed at the abattoir. I found it impossible to obtain the necessary figures for a foundation on which to base similar computations in the United States. However, the number of cows in this country is more than double that which France contained at that time, and from some few points that I obtained from a wholesale butcher in this city, the number destroyed annually for meat purposes is in a like ratio increased. This would make about 1,600,000 as a rough estimate of the cow butchery in this country annually. I believe we should not over-estimate the loss from the non-castration of this number of cows if we figured it at double that in France at that time; for, while the difference in the price per hundred-weight for the dressed meat of the castrated and the non-castrated cows (which amounted to about $1.00 in France,) might be less in this country, (although I hardly believe it would be the case). Our cows average much heavier than the French cows, and, consequently, there would be more meat per head to compute upon. Estimating in this way, the annual loss in the United States from the non-castration of the cows would amount to 56 millions of dollars. To this should be added the loss from the useless wholesale waste of meat from the old cows on the ranches being allowed to die.

To use the words of Gourdon, "This is a real loss without compensation, which weighs at once upon the purse of the cultivator, and the public food, and which diminishes the quality of the meat. This could be avoided by castration, the effects of which would be more decided as the operation would be practiced under conditions more favorable as to age and health."

In New York there is some difference in the price paid by the butcher between the spayed and unspayed cow. Outside of New York, I can find no regular rates of difference. The Chicago

cattle brokers make no variance in the price they pay for cows. If a number of castrated cows in good condition arrive mixed with steers, they are bought in at the same price per pound as the latter, but, if with a lot of natural cows, no distinction is made. Of course this is all wrong, but the castrated cow is not a staple article in the United States market as yet, and until she becomes such, so that the butchers may be able to realize her increased value, there will be no regular rates of exchange for such animals. Furthermore, they can never become a staple article until the educated Veterinarians practice ovariotomy, thus gradually withdrawing it from the hand of the empirics, thereby decreasing the mortality following tne operation, and thus illustrating to the agricultural world what practical benefits may be derived from its universal introduction.

NEW RESEARCHES UPON PLEURO-PNEUMONIA AND ITS PREVENTIVE INOCULATION.

By Dr. Willems.

(*Continued from page* 422.)

III.

Can pleuro-pneumonia when inoculated be communicated to non-inoculated animals kept in the same sheds?

The answer must be negative. This disease is transmissible only by contagion, by inoculation of pathological products, and by re-inoculation.

I have successfully practiced re-inoculation with secondary virus. The official commissions of the Netherlands and many other operators have done the same.

Mr. Lenglen, of Arras, reported that he had inoculated 1,000 subjects with secondary virus, obtained by an incision at the tail of an inoculated animal, and he adds—"To-day I used a virus of the twenty-fifth generation, which has lost none of its protective virtue."

It is well to bear in mind that the inoculated disease is transmissible to healthy animals only by re-inoculation, as many farmers and cattle keepers are afraid to keep inoculated and healthy animals together.

In non-infected stables where inoculation is performed, the cattle will remain perfectly healthy until a new contaminated subject is introduced. Then only non-inoculated animals become generally diseased, while the inoculated resist the contagion. This is invariable, and can be observed wherever the opportunity occurs.

According to the experiments of Prof. Simonds of London, and of Henry Bouley, it would appear that the virus of pleuro-pneumonia remains, so to speak, fixed in the tissues of the animal, and does not became diffused in the surrounding air.

M. Bouley says—"Experiments were begun in the Royal Veterinary College of London in 1870, and continued at intervals till the end of 1874. During the investigations, several means of mediate infections were tried. An animal was exposed to the vapors of the diseased lungs of a cow which had just been destroyed and which had been placed immediately under her nose, in such a way that they had to pass into the respiratory organs at each inspiration. No positive result was obtained."

"In another case, a sponge which had been kept in the nose of a pleuro-pneumonic cow, was placed in the nostrils of a healthy animal and kept there for half an hour. The results remained also negative.

"Then," adds Mr. Bouley, "there must be some reserve made in regard to the various ways in which contagion may follow, and it is to experimentation specially that one must look to enlighten our practice as to the *surely determined* condition of the possible modes of contagion, by living or inanimate intermediates."

Prof. Gamgee of London, says:

"An objection made against inoculation, and which equally applies to vaccination of man, to variola of sheep, and to rinderpest, is that the inoculated disease is contagious, and that by it, infecting centers are increased. Tnis objection has no value, at

least so far as it concerns pleuro-pneumonia, for the inoculation-disease is not communicable except by re-inoculation. My observations on this point are numerous; during the seventeen years when inoculation was extensively practiced, I do not know of a single example of contagion arising from an inoculated animal.

IV.

Exudative pleuro-pneumonia is a disease of the bovine species, and is not communicable either to other animals or to man, by either cohabitation or inoculation. My numerous observations on this subject have already been related.

Facts noticed by myself and by many other observers confirm this truth. Animals of all species, especially swine, have been fed with the cadaveric remains of pneumonic animals. They were placed in permanent contact with diseased subjects; they have been inoculated with the exudat of the lung. I have made these experiments on goats, sheep, horses, pigs, rabbits, birds, and never did I obtain positive results.

There was even a popular belief, that the emanations of the entire goat constituted a prophylactic against against epizootic pleuro-pneumonia, and many have adopted the custom of placing one of these animals in their sheds, but without any advantage in the point of view of protection to cattle.

"Each parasite," says Mr. Chenier, "has its organism of predilection, outside of which it does not find, or does it imperfectly, its conditions of existence, growth and multiplication. Transported to an improper medium, it dies like a seed in an unfertile soil."

"If to those characteristics of parasites, we compare those of virulency, we are brought to the conclusion of a striking analogy. As the parasites, viruses have their organism of predilection, outside of which they cannot live or grow. The virus of foot and mouth disease, for instance, dies out when introduced into the equine organism."

V.

Before finishing, I believe it advantageous to make some recommendations to those who will inoculate.

The serosity which escapes from the divided lung of a cow affected to the first or second degree of the disease, and sifted or filtrated, is the best to use in the practice of inoculation and should be inserted on one of the lateral faces of the extremity of the tail, by two punctures with a lancet, about the width of two or three fingers apart. The operation is made like vaccination, by incision of the epidermis and deposit of a drop of vaccine in the cellular tissue and in the dermis; the animal is then left to itself without any other care. It is prudent, however, to give him a good clean bed, to protect the wound from infection by contact with decomposed matters.

The liquid of inoculation must be as fresh as possible, as I have often observed that the one, two, or three days old is very virulent.

When the local inflammation becomes too active, a purgative is administered; three or four hundred grams of sulphate of magnesia.

When there appears at the point of inoculation a hard, warm, inflammatory swelling, painful to pressure, we must hasten to make incisions, and to excite suppuration by local irritating agents, for as soon as this is obtained we may be sure that the infiltration will not spread; and the animal is saved.

Some operators remove the portion of the tail above the swelling, and others cut always, to prevent the local accidents which may take place twenty-four hours after the operation, the portion of the tail where the inoculation has been performed.

If, from fifteen days to three weeks after the operation, no appreciable effect at the point of inoculation is observed, it is well to have recourse to a re-inoculation.

When the disease appears in a stable it is necessary to isolate the animals yet apparently healthy, and to inoculate them at once, using, for this, the serosity of the lungs of one of the diseased animals killed at once.

No fresh, sound animals ought to be introduced into infected stables without having them thoroughly disinfected, as without this precaution the newly arrived animals would be brought immediately under the influence of contagion, and the disease would

continue to appear indefinitely. Preventive inoculations applied to this new stock would have no beneficial effect, as it would be at the time of the operation infected through the ordinary channels of contagion.

Before entering the sheds which are infected, recently or of long date, horned cattle must be subjected to quarantine, that is, for three or four weeks placed in a non-suspicious place, remote from infected stables, and be there inoculated the first day of their arrival. When once the inoculation has produced its beneficial effects, they may be placed in infected barns with impunity, without fear of the dangers of contagion. This wise measure is also necessary, because often amongst the newly purchased animals there may be some already affected with latent pleuro-pneumonia, or being in the incubative stage of the disease which everyone knows may be quite protracted.

If cattle owners do not scrupulously follow these rules, they will expose their herds to the effects of the scourge, with so much certainty that inoculation in their hands will then be but a fallacious preventive, which instead of giving favorable results, will only be followed by failures due to the empiricism and carelessness of the operators.

(*To be continued.*)

REPORT OF CASE.

EMBOLISM OF THE ARTERIES OF THE LEFT HIND LEG FOLLOWING PNEUMONIA.

By A. A. HOLCOMBE, Inspecting Veterinary Surgeon, U.S.A.

The infrequency of recognized embolism in the equine species renders particularly interesting the reports of such cases as have been observed and published in veterinary literature. In the majority of these cases, the embolism results from primarily diseased blood-vessels, and the embolism is found lodged in some

branch of the affected vessel. From the information I can gain on the subject, it would seem that rarely indeed does embolism of the lower animals result from lung lesions. That the case to be described was embolism will, I think, be conceded, and that it resulted from the diseased lung would seem highly probable.

On the 14th of December, 1880, a six-year-old bay trooper—a recent purchase—was sent to the hospital as being "off his feed." On making a hasty examination, influenza was diagnosed, the temperature being 107°, the pulse rapid, soft and weak, with cold extremities and the mucous membranes of that bright red, slightly tinged with yellow, so often seen in this disease. There being but a slight cough and the respiration good, half-ounce doses of the tincture of belladonna was ordered given three times a day. During the next four days no important change took place, nor was there any improvement excepting the gradual reduction of the temperature to 105°. The appetite was very poor. On the morning of the 18th the respirations were greatly increased in frequency and becoming quite labored. An inspection of the chest revealed the lower two-thirds of the left lung in the first stage of pneumonia. The treatment was now changed to active stimulants, consisting of carbonate of ammonia, camphor and ginger, two drams of each three times a day. The case progressed from this time on to the 21st as usual, the appetite being fastidious and the patient assuming the recumbent position a good part of the time, always lying upon the side of the diseased lung. During this time two two-dram doses of the sulphate of quinia were given to reduce the temperature, which had remained at 105°. On the afternoon of the 21st the lung showed signs of clearing up and the temperature was down to 103⅘°. On the morning of the 22d the respiratory murmur was quite audible in a few places where the lung had been diseased, the temperature lowered to 102°, and the appetite quite good.

At nine o'clock on the morning of the 23d, while making the daily hospital round, I remarked to the steward the rapid improvement of the patient, the pulse and respirations being nearly normal, the lung almost cleared, the temperature at 101°, and the animal bright and playful. At ten o'clock the steward sent word

to me that No. 12 was very sick. Hurrying to the hospital, I learned that a short time after my previous visit the patient had assumed the recumbent position, as usual on the left side, remaining there quietly until nearly ten o'clock, when he got up, began to sweat and to breathe rapidly, then to lie down and get up repeatedly as in spasmodic colic. Being greatly surprised at the sudden change, I made a critical examination of the patient with the following result. He was lying on the left side, steaming with perspiration, nostrils widely dilated and the mucous membrane bright red, respiration rapid and accompanied with a groan, occasional straining as if to avoid fæces, and frequent clonic spasms such as are seen early in poisoning from strychnine. The patient on being made to arise, stood with the back arched, the head held low, the hind feet well advanced and moved only on compulsion. When locomotion was attempted it was seen that the left hind leg was losing some of its power, for although the leg was advanced fully as well as the opposite member it was irregularly placed on the ground and would knuckle over at the fetlock; in fact, I was forcibly impressed with the resemblance which the leg bore to that of a person attempting to walk with one leg "asleep." An examination of the leg revealed nothing, neither did a rectal examination, the fæces being soft, the bladder empty and the circulation of the iliacs perfect.

I could not make a diagnosis, for sensation was perfect in all parts of the body and no lesion could be detected in the lame leg, so I determined to treat the most prominent symptom—extreme physical suffering—and to this end administered a two-ounce dose of tr. of opium with one ounce of sweet spirits of nitre. After a time the patient became more quiet and again rested on the left side. Repeated inspections of the left leg revealed a decreasing temperature of all the parts below the middle third of the tibia. This loss of temperature increased until the lower part of the leg became cold as dead flesh. I believed now that I had a solution to the difficulty, for the pulse could not be felt in the digital arteries, while it was perceptible as ever in the iliacs; no appreciable ingress of the blood to the cold parts took place; the functions of the foot were entirely suspended, while the upper parts of the leg

remained apparently normal. Believing embolism alone could explain the symptoms, the patient was given a small dose of aloes with dram doses of belladonna repeated twice daily. The affected leg was repeatedly rubbed with a strong liniment composed of oil of turpentine, solution of ammonia and olive oil, and thickly bandaged. The patient was put in slings, but after three or four trials was returned to a box stall, for he was continually fretting, seemed irritable, off his feed, inclined to throw all his weight on his supports, while the leg above cold parts was swelling continually. This was on the 27th. On the night of the 28th the patient lay down, but needed assistance to get up. The leg seemed a little warmer than heretofore, and the swelling was lessening. From this time on to the present the patient has been steadily improving; as the leg became warmer the ability of the patient to use it has increased, until now it is nearly recovered. The pulse was perceptible for the first time on Jan. 6th, in the digital arteries, and, although very feeble at first, is now nearly as strong as in the opposite member. That recovery will soon be complete does not seem doubtful.

Fort Leavenworth, Kansas, Jan. 13th, 1881.

EXTRACTS FROM FOREIGN JOURNALS.

ECHINOCCOCI IN THE SUB-LUMBAR, GLUTEAL, ANTERIOR AND POSTERIOR CRURAL REGIONS OF A HORSE.

By M.M. Ranvier and Dehors.

The subject, a heavy draught horse from eighteen to twenty years old, fell on the left hind leg, and ten or twelve days after was found to be lame. The croup was swollen, the swelling being principally marked at the external angle of the ilium, and extending toward the upper part of the flank; it was not painful, and showed no signs of inflammation. Nothing else being found,

a revulsive was applied on the coxo-femoral joint. Eight days afterward the animal presented the same condition and lameness. He was kept to work.

Five months afterward the swelling of the croup had almost disappeared. In the upper part of the flank, near the angle of the ilium, an enlargement existed, painless and not fluctuating. Rectal examination revealed a tumor about the size of a man's head, oblong and slightly fluctuating, on the internal side. Exploring puncture with the aspirator was made, from which escaped a yellowish transparent fluid. A larger trocar being introduced, allowed the exit of a small membrane, very delicate. Eight days afterward a yellowish-white pus escaped from the opening.

There were then general serious symptoms: great dullness, general prostration, poor appetite, pulse small and thready, respiration regular, but short and accelerated, temperature 41°3. What was supposed to be an abcess—the tumor—was opened with pointed cauterization. With the pus which oozed out several little bladders escaped, consisting of a thin, gelatinous membrane, with a transparent, citrine colored fluid, and having in suspension some yellowish-white bodies. The membrane was sometimes colorless, of a dirty white, and again a rosy or deep red color. The liquid remained in all of the same aspect. About thirty of these bladders were removed at this first operation. Treatment consisted of carbolic water dressing.

Two weeks later the animal looked well. Fever had subsided, the tumor had reduced on the outside, as well as on the inside, and numerous vesicles had been discharged. Lameness disappeared on walking. Same treatment.

A week after, the wound of the cautery was closing, expulsion of the vesicles difficult, and the pus had become offensive. A few days later general symptoms reappeared, and on account of weakness and debility of the patient, and the unfavorable aspect of the case, the horse was destroyed.

At the autopsy a voluminous tumor, extending from the left kidney to the superior border of the ilium, was found. It was bosselated, oblong, situated in the sub-lumbar region, in the psoas

muscles, and united by strong adhesions the left kidney with the two last ribs, the body and transverse processes of the lumbar vertebræ, the anterior border of the ilium and anterior crural muscles. Cut transversely and longitudinally, it was found to be formed of irregular cavities, separated by walls of variable thickness, and yellow in aspect. These cavities communicated, and contained a large quantity of grayish pus, in which floated hundreds of echinoccoci, some in their primitive spheroidal shape and containing a clear liquid, while others in greater number were shrunk and almost dry.

Some of the cavities were distinct and closed. For instance, towards the anterior extremity of the tumor there existed one, subdivided also, and contained vesicles of various size. Some quite large contained a liquid in which floated smaller ones.

Near the superior border of the ilium the tumor extended in the deep gluteal muscles, behind the hip joint, the posterior face of the femur and ended in cul de sac towards the inferior extremity of the posterior crural membrane.

Again, towards the external angle of the ilium it was continued in the thickness of the triceps cruralis.—*Archives Veterinaires.*

UPON THE SYNGAMUS TRACHEALIS AND ON THE DISEASE IT PRODUCES.

By M. Megnin.

There exists for several years back in France, and for a long time in England and America, amongst wild and domesticated gallinaceous, an epizooty which killed those animals by thousands. This disease is due to a parasite, a *red worm* which grows in the trachea and kills the birds by asphyxia. It is the *syngamus trachealis* of Siebold, well-known zoologically, but not so well as to as its anatomy and physiology, and unknown as to its development and mode of propagation.

From several years' observation, M. Megnin says that this curious worm develops and propagates as follows:

1. The egg, in a damp but cold medium, preserves its vitality for years.

2. The embrios contained in the eggs develop and hatch at a temperature of 20 to 25 degrees.

3. The development and hatching is much more rapid when the damp medium is nearer the temperature of the body of a bird, say 40 deg.

4. The embryos of Singamus, which are anguilluliform, may live in water of ordinary temperature for several days, and even weeks, but undergo no changes.

5. Birds are contaminated in absorbing the embryos contained in their food and drink.

6. Birds are contaminated also in directly absorbing adult worms full of eggs which are expectorated, worms which then look like small earthy lombricoids, or better to the red larvæ of tipulæ of which gallinauous are so fond.

7. Larvæ of ants or other insects which are eat by birds, do not contain embryos of syngamus, and cannot be a cause of propagation.

8. Garlic and asafœtida mixed with the food, and salicylic water are the best agents to destroy the embryos and stop the disease.—*Gazette Medicale.*

OBITUARY.

Peter Nostrand, D.V.S., who graduated in 1871, died suddenly on the 9th of January, at the age of 41.

HUMAN AND ANIMAL VARIOLÆ: A STUDY IN COMPARATIVE PATHOLOGY.

By George Fleming, F.R.C.V.S., Army Veterinary Inspector.

(From the Veterinary Journal, London, England.)

(Continued from p. 436).

Goat-Pox.

The goat has a variola of its own, which possesses as special and distinctive characters as that of the animals I have already described, and is entirely independent of infection from other species. In some countries this *variola caprina* is apparently unknown, in others it is extremely rare, while in at least one country, Norway, it is a frequent, if not a continuous disorder amongst the caprine population. I am not aware if it has ever been witnessed in this country, where goats are so few in number. For Germany, Hering says the disease is rare.* Hertwig† describes an outbreak, and gives illustrations of the eruption. The animals were at first unwell, and there was diminution of the lacteral secretion, with great sensitiveness of the udder—the goats had been in milk about three weeks. The first pock was seen on the udder, and on the fifth day was the size of a pea, standing about two lines above the skin, flat, apex rounded, moderately red, with a small areola, which increased in size. Two or three days afterwards the pocks were reduced to the size of a hempseed, pale-red and firmly adherent to the skin. On the tenth day they were quite dry and covered by a thick brown crust, which on the eighteenth day fell off, leaving a cicatrix. The disease had much more resemblance to cow-pox than to sheep-pox. Spinola, in 1847, witnessed a similar outbreak, the eruption being most visible on the udder. In September, 1832, the disease appeared

*Specielle Pathologie und Therapie für Thierartze, p. 389.

†Magazin für Thierartze, Band vi.

among a drove of goats (54), in Geislingen, attacking first seven, then three of the number. In some of them there was a fever at the commencement, then the eruption of pustules; though generally there was little constitutional disturbance, and only dimunition of milk, with soreness of the mammæ before the pocks appeared. Sheep in contact with these goats were not affected.* But Bollinger says it is so infrequent, that in the course of twenty or thirty years scarcely half a dozen cases are recorded. He is of opinion that goats receive the disease either from cattle affected with vaccina, or sheep suffering from sheep-pox. But he admits that though now and again the same form of variola is witnessed in cows and goats, yet that the latter, as a rule, remained exempt from the disease when confined in the same stable with infected cows, and that the inoculation of goats generally yielded negative results. In order to prove that goats may be infected with sheep-pox, he gives the following on the authority of Prietzsch: "In a stable in which sheep suffering from sheep-pox were confined, three goats were simultaneously attacked with the disease, the eruption being the same as in the sheep. Upon the udder were numerous pisiform variolæ, in the form of hard, flattened papules, with a trifling amount of lymph; papules were also distributed over the body, being more numerous upon the hind extremities than the abdomen. Marked symptoms of fever were also present, with inappetence, swollen lips, and a somewhat profuse mucopurulent discharge from the nostrils. In fourteen days convalescence was established. Two other goats were inoculated on the ear with the virus of sheep-pox; a single pustule formed at the seat of inoculation, and the animals did not afterwards take sheep-pox."

That there is no relationship, so far as origin is concerned, between sheep-pox and goat-pox, nor yet, for that matter, human variola, is evident if we look at a count rywhere the latter is all but unknown, and the former is not seen. From 1864 to 1876 inclusive, sheep-pox has been reported only twice in Norway; in 1865 there were two cases, and in 1868 fifteen cases, all due to

*Op. cit., 1856.

forein importation. According to Hansen, the official veterinary surgeon in central Norway,* in 1867–68–69 and 1874 and 1875, extensive outbreaks of goat pox were observed; and according also to the official veterinary statistics in 1865, eleven cases of the so-called "water-pock" (*variolæ serosæ*), and in 1868 four cases of common goat-pox were recorded in south Norway. Many cases which escape the notice of the Government veterinary surgeons are supposed to occur. In 1871 Dr. Cæsar Boeck, of Christiana, was on a botanical excursion in south Norway, and in July, in Thelemarken, he saw a drove of cows and goats being driven from the woods into their huts. The cattle were quite healthy, but about forty of the goats were affected with a variolous eruption on the udder and teats, as well as about the mouth. In some there were merely deep dark-colored sores remaining, in others—the majority—there were seen thick brownish crusts, about the size of a pea, on the mouth, udder and adjoining parts; while in a few the disease was so recent that, with the crusts, there were also observed pustules from the size of a lentil to that of a pea. From inquiry and examination, Boeck was of opinion that the exanthem had been more or less general over the body, and that there had been fever and resulting emaciation. The milk secretion had been almost diminished, and the fluid itself was drawn with difficulty and pain. None of the goats had died, and no other animals had, so far as the shepherdess knew, been in contact with her drove. The cows were fifty in number, and none of them showed the least trace of disease. The cows and goats were milked indiscriminately by three women, whose hands were not washed from the commencement to the end of the operation; so that there was abundant opportunity for transmission of the disease from the goats to the cows, had the latter been susceptible; while the constant association of the two species, particularly in the closely-packed sheds, gave every facility for infection through the medium of the atmosphere, if this could have taken place. Experimental inoculation would have been tried, but no good lymph could then be found. The epizoöty

*Gudbransdalen d. h. Gudbrandsthal.

appeared in the spring, among the four-year-old goats which had been kept during the winter by themselves in small sheds. When they joined the other goats at a later period, the outbreak became general in a short time. Flocks of sheep associated with the goats without any disease resulting in them. Sheep-pox—a very fatal disease—had never been seen in that part of Norway. Boeck, who contributes his observations to the *Deutsche Zeitschrift für Thiermedicin* for December, 1879, alludes to veterinary surgeon Hansen's observations with regard to the outbreaks in 1867-68-69 and 1874-75, in Gudbrandsdalen. In the first year the malady appeared in August in two different flocks, numbering 170 goats, attacking without exception the males, kids and those in milk. In the males the eruption was sparse, and limited to some pock pustules on the scrotum. (In the following year the exanthem on the males extended to the inner surface of the thighs.†) Hansen was called in when thirteen of the 170 goat had died, and nearly all the others were affected. On examination of two of the carcasses, he found the eruption all over the body, and pustules and ulcerations on the mucous membrane of the stomach and intestines, as is often witnessed in malignant sheep-pox. The origin of the outbreak could not be accounted for, the goats not having been in contact with strange animals, and there was no similar disorder prevailing among other creatures. "I have practised in Gudbrandsdalen," says Hansen, "for twenty years, and I have never seen either cow or sheep-pox." In the goatsheds were sixty cows and eighty sheep, but these remained healthy.

In June, 1868, in another district of the same parish, Hansen was sent for to see a herd of goats, and of 114 eighty-four had eruption of pocks on the udder and teats; twenty were severely affected, and, in addition to the pocks on the lacteal apparatus, there were many on the inner side of the thighs and on various parts of the abdomen, some of them having ruptured and left

†From this it will be seen that the male goats are as liable to the goat-pox as the females. It is the same with the rams associating with flocks of sheep, and which suffer as much as the ewes; and it would be the same with bulls or bullocks, did they consort with cows affected with cow-pox. Sex makes no difference.

large sores. The pain was so acute during milking that the animals cried and struggled, and had to be held. The milk was rather viscid and mixed with blood. The disease existed in all stages among the animals, from red spots to shedding crust and the formation of cicatrices. The outbreak had only occurred eight days previously. Thirty animals were yet unaffected, and these were isolated. The neighboring goat-farms were free from the malady, and Hansen could not account for its presence on this farm; but as it was only distant about half a mile (Norwegian) from the place where it prevailed the previous year, it might have been conveyed from there. In July all the goats on the farm had been infected; at the commencement of August goat-pox had nearly disappeared, and during the entire period of the outbreak the cattle there and in the neighborhood had continued healthy.

On August 17th of the same year, Hansen was again called to attend upon goats at another place, not far from the last, where there were seventy-four goats, only thirteen of which were free from goat-pox. Twelve were severely affected, and three were so ill that they could not follow the others. The pocks on the udder, teats and thighs could be studied from the first or inflammatory stage to the crust-forming and cicatrising period, the cicatrices being distinguishable from ordinary scars by their light hue. The diminished secretion of milk and the emaciation were very marked, though the malady was not so fatal as in the previous year. On four neighboring farms the disease also appeared among the goats.

When the disease once appeared in a flock it spread rapidly, and spared neither young or old, male or female; those goats giving the most milk having, however, the mildest attack, and the males having the pock-pustules most developed on the inside of the thighs. The contagium might have been conveyed to these farms by direct contact with the first infected farm, or, as was more probable, through the medium of servants and children. In the following month a number of other farms were visited by the goat-pox. Some of the goats had phlegmonous inflammation of the udder as a consequence of the disease, and had to be killed.

In 1869 two herds of goats were attacked, but timely and

careful treatment having been adopted, the results were not so serious. The milch goats were the worst attacked, and the mortality was greatest in the largest herds. The total number of cases for this year was 129. In the four succeeding years Hansen did not know of any outbreaks.

In July, 1874, goat-pox broke out in two different districts, one and a half Norway miles apart, three farms being visited by it—one with 150 goats, another with 120, and the third with 60. All of these were more or less affected. The disease first commenced with slight fever; then followed efflorescence, subsequently the eruption on the udder and teats of small vesicles the size of a pea, and which soon became converted into pustules. Not unfrequently suppurating furunculi formed, and the whole udder was involved.

In some instances pocks appeared on the lips. Towards the end of August, there were reported 580 cases of goat-pox in the two localities. On the neighboring goat-farms the disease was not seen. There was no evidence that it could be communicated to mankind, though it appeared not improbable that mankind could convey it from one flock of goats to another. Ten deaths only were reported. In 1875 there were 200 cases. Hansen states that altogether there were 1,300 goats attacked, with from twenty-five to thirty deaths—about two per cent. The incubative period appeared to be short, certainly not longer than a week, while the duration of the disease was from two to three weeks in severer cases. The pock cicatrices were more or less stellate-shaped. Immunity was very rare indeed, nearly every goat exposed to the infection taking the disease. The outbreaks always occurred during the summer months, and the epizoöty did not extend beyond Hansen's official district. Boeck and others competent to judge had no doubt whatever that the disease was variola. Neither sheep nor cattle, notwithstanding their constant exposure to infection and being crowded with the goats in close sheds, became infected. Human variola was not present in the district during the years when goat-pox prevailed.

I have entered into these details with regard to goat-pox, because they support in the strongest manner the position I have

taken up with respect to variola in man and animals, and prove that, inasmuch as we have shown that there is cow-pox, a horse-pox, and a sheep-pox, there is also a goat-pox, independent of the variolæ of other animals.

Swine-Pox.

Swine-pox is not a very rare disorder, and though I fail to find more than one outbreak recorded as occurring—though outbreaks may be frequent—in this country, yet I have been assured by a very observant and competent veterinary surgeon that he saw a large number of swine suffering from the disorder in Kent. No small-pox or cow-pox was present in the locality. Like the ovine variola, the *variola suilla* is a general eruptive disease, the symptoms being pretty constant in their development, and resembling those of sheep-pox. After the febrile phenomena, which are often very intense and continue for some days, there appear on the back, abdomen, chest, neck, head and inner surface of the thighs, petechiæ, which soon become papules. Towards the sixth day there are vesicles, and about the ninth or tenth day, pustules; the contents begin to desiccate and form crusts, which are eliminated in a few days, leaving a well-defined cicatrix. The eruption appears discrete and confluent, the disease being benignant or malignant, regular or irregular, according to the form it assumes. Young pigs are most susceptible, and the mortality often reaches twenty or twenty-five per cent. Hering has seen the disease in older swine. The malady is very contagious, and its course and complications, as well as infectiousness, are very closely analogous to those of sheep-pox. One attack protects from another. Felix (*Recueil de Méd. Vétérinaire*, 1827) describes an outbreak which prevailed among the swine in the Dordogne department, during four years; and Rueling,* Greve, Spinola,† Viborg‡, Pozzi, Gasparin, Eisele,§ Hering, and competent veterinary authorities have studied swine-pox at various times. Gerlach has experimentally

*Physikalisch Medicinisch, Oeconomische Beschreibung der Stadt Nordheim, 1779.

†Schweinkrankheiten, 1842.

‡Behandlung des Schweines als Hausthier, 1804.

§Krankheiten der Schweine.

proved that the disease can be transmitted to sheep, and the sheep-pox to pigs. Cases of accidental transmission from sheep have been recorded. Bollinger mentions that some young swine were attacked after being lodged in a pen where diseased sheep had been located some months previously, and these pigs communicated their malady to others which had not been in the shed in question. But that there is no generic relationship between swine and sheep-pox is again proved by reference to Denmark, where the latter does not exist, and where, nevertheless. swine-pox is sometimes prevalent, as in 1878, when it appeared in several localities in Jutland, according to the veterinary sanitary reports of that kingdom. The same evidence could be given with respect to other countries. Viborg, Spinola and Hering have proved that the disease is readily inoculable to other pigs. Rueling, Viborg and Hering have not been successful in transmitting swine-pox to the horse or cow; though Gerlach succeeded in inoculating a goat. The transmission of swine-pox to mankind has been sometimes noted. Arnsberg,* for instance, knew of three persons who had been infected; and Roell gives similar evidence. Accidental transmission of human small-pox to pigs has been recorded now and again, and that this transmission may take place I do not deny; but it certainly does not prove that swine-pox is dependent for its origin on small-pox. The former occurs where the latter is not present, as in Denmark, and small-pox may rage for years in districts where pigs are numerous, and the latter show no signs of variola. In the Würtemberg reports for 1877, mention is made of the prevalence of the "wild" or *wasserpocken* (*variolæ serosæ*) among suckling swine. These pocks soon burst, and their contents mixing with milk, were ingested by the young pigs in the act of sucking. These had in a short time a yellowish-brown eruption, first about the eyes and nose, and then over the entire body. When the eruption was noticed early, and the young pigs were then removed from the sows, the consequences were not so serious; but when the exanthem extended over the entire body, they quickly died. Bathing them in bran water or camomile tea

*Gurltzund Hertwig, Magazin für Thierheilkunde, band x.

was supposed to have cured a good number. No mention is made of small-pox among people. In 1878, according to the *Veterinary Journal* (vol. vii., p. 210), there was a serious outbreak of swine-pox in many localities in the Hernals and Baden districts. It first appeared among swine of Hungarian origin imported from Odenburg, and from them was communicated to the native herds. The mortality was unusually great. The conditions attending the appearance, course and termination of the disease, were precisely analogous to those which obtain in sheep-pox, and the veterinary sanitary measures in force for the latter were adopted successfully for the swine-pox. No mention is made of sheep-pox, cow-pox or small-pox prevailing at the time.

Dog-Pox.

In the dog, variola has been observed and described by many authorities, and is, in fact, a comparatively well-known disease to veterinarians. It chiefly attacks young dogs, though old ones are not exempted, and one attack affords immunity from others. *Variola canina* commences, as in other animals, with fever, which continues for two or three days, and is then followed by the appearance over a large surface of the body, though rarely on the back or sides, of red points resembling flea-bites, which in a very short time are the seat of papules, and then of vesicles. The contents of these become purulent, and finally dry into a crust, which, being shed, leaves a marked cicatrix. In the dog, as in sheep, goat and pig, the disease does not always maintain the same form; it is sometimes epizoötic, and is benignant or malignant. Young dogs nearly always succumb, and a necropsy often reveals the presence of variolous pustules on the mucous membrane of the respiratory and digestive organs. The disease does not appear to be very infectious, though it is contagious and inoculable. It appears to be communicable to mankind, for Bosenroth* saw the disease affecting dogs around the nose, face, eyes and back, and the attendant became infected. The dog does not appear to be very susceptible to the variolæ of other animals, nor yet to that of man. I can find few instances mentioned in

*Magazin für Thierheilkunde, 1860, p. 341.

which small-pox was communicated to this creature, notwithstanding its very close association with mankind, and consequent exposure to infection.* Greve inoculated eight dogs with the matter of human small-pox, and three of them became covered with pustules and died. Vaccination only develops insignificant bullæ containing pus; scarcely any "pit" remains.

I am not aware that variola has ever been observed in the cat.

Camel-Pox.

The camel has long been known to suffer from variola. Agnelli, in 1850, observed an outbreak among camels in Algeria, the symptoms of which were like those of cow-pox, especially when transmitted to mankind. When the Arabs were inoculated with the lymph they were protected from small-pox. Mason† makes similar remarks with regard to the camel in India. He mentions the accidental and artificial transmission of the disorder to the human species, and states that when children were inoculated from the camel they had a more or less general eruption, which was nearly always malignant, exceptionally mortal.

Variola in Hares and Rabbits.

Hares and rabbits are said to have a form of variola, especially in north Germany, and which sometimes is very malignant. It has been believed for a long time, in those countries in which sheep-pox is prevalent, that rabbits receive infection from these in grazing on the same pastures; and it has even been asserted that whole warrens have been cleared of their inmates by the transmitted disease. Astruc, Paulet and Gasparin, a French authority and good observer, state that sheep-pox is frequently

*The supposed cases of transmission are not all conclusive. They are generally of the same kind as that detailed by a writer (G. A. C.) in the *Field* for September 2d, 1871. "Two or three members of the family of a person who was rearing a beagle for me, were ill of small-pox, and some of the bedclothes were being steeped in water preparatory to washing them. The beagle was seen to lap some of the water, and in a few days he died, covered with small-pox. Cases of dogs taking the disease have happened, I believe, but very rarely."

†Narrative of a journey to Khelat, Trans. of Med. and Phys. Soc. of Bombay 1840, p. 214.

conveyed to hares and rabbits; and the observations and experiments of Curds, Dominick, Spinola and Gerlach support the statement. Inoculation from one to the other species has always yielded positive results.

Variola Gallinarum, Anserum, Etc.

Fowls have also their variola, according to the reports of various observers, published during many years. Bollinger has investigated what was supposed to be variola in a poultry-yard at Zurich, but found it to be a contagious epithelioma, chiefly localized upon the head. But what appears to be a true variola has often been studied in fowls, as the loss it caused was very great, and its contagiousness caused it to be widespread. In these outbreaks the birds were dull and feverish, the feathers stood erect, the wings and tail were pendulous, and an eruption of pustules appeared on the head, neck and inner surface of the wings and thighs. In the turkey they appeared as citron-tinted vesicles, surrounded by a red areola. In from twelve to fifteen days after their development these pustules became crusted, the fever disappeared, and health gradually returned. In geese the pustules on the neck not unfrequently increased in size and formed abscesses; the feathers were shed, pieces of skin even became detached, and the resulting lesions were so serious that death was not an unusual termination. The disease was very contagious.

In the official report on the sanitary condition of the domesticated animals in Belgium during 1878, I find that Government Veterinary Surgeon Déjonghe, of Wyngene, describes this variola of poultry. It prevailed as an intense enzoöty during the last half of 1878, frequently attacking all the fowls on a farm, and being most prevalent in low, damp situations. It was markedly contagious, or rather infectious, and the prevailing winds had apparently some influence in its dissemination. Young birds suffered most severly, and bad food aggravated its severity. The earliest observed symptoms were erect plumage (horipilation), complete indifference, *malaise*, and general prostration, anorexia, great thirst, ardent craving for cold water, and rapid emaciation. There appeared on the skin and visible mucous membranes numerous

small nodules, which were soon transformed into pustules. Most frequently these pustules ruptured soon after their appearance, fetid matter escaped, and only snperficial sores remained; these generally cicatrised rapidly. Where the skin was thick, cicatrices, often deep, remained. On the respiratory mucous membrane the pustular eruption caused an abundant formation of muco-pus, which sometimes caused death by obstructing the air-passages. Generally, however, a fatal termination seemed to be due to debility, septicæmia, or pyæmia. In birds which survived, complete recovery did not take place for a long time.

(*To be continued.*)

LAW RELATING TO THE PREVENTION AND SUPPRESSION OF EPIZOOTIC IN GERMANY.

Passed June 23d, 1880.

We, William, by the grace of God, Emperor of Germany, King of Prussia, &c., in the name of the Empire, with the consent of the Federal Council, and of the Reichstag, order the following:

SEC. 1. The following law regulates the measures to be taken in the interest of the prevention and suppression of contagious epizootics of domestic animals, rinderpest excepted.

Are considered as suspicious animals in the sense of the law:

Animals which present signs of such nature as to fear the eruptions of a contagious epizooty.

Animals which do not precisely present signs of that nature, but which make it presumable that the contagious virus was communicated to them.

§ 2. The measures of prevention and of suppression, as well as the direction of the measures to be taken, will be given by the order of the government of each particular state and its organs.

Special commissioners may be charged with the direction of those measures.

The coöperation of the veterinarians which are named by the State, or whose nomination has been approved by the State, will be conformed to the prescriptions of the present law. In case of prevention, or for other motives, approved veterinarians may be called in their place. These last will have the right and duty to fulfil, in the limit of their appointment, the functions allotted by the present law to the official veterinarians.

The particular States shall prescribe the dispositions of detail, relating to the measures to be taken, to the competency of the authorities and functionaries, as well as to the manner of settling the expenses that these measures will incur.

§ 3. Relatively to horses, and animals of victualling belonging to the military administration, the military authorities are authorized to take such measures they may deem necessary to the discovery and suppression of epizootics, so long as these diseases will affect only the property of that administration.

This authorization may be also granted by the governments of the different States to the directories of depots of military remountings, as well as relatively to animals of bovine and ovine breed they may possess; it may also be granted to the directors of the crown and State studs, relatively to the horses found there.

In both cases (art. 1 and 2) the following can be applied by analogy.

The military authorities are bound to inform, as early as possible, the police authorities of the garrison, consignment, and places where troops will pass, of the signs which make suspect the existence of an epizooty, or of those which characterize the eruption, as well as the march followed by the disease and its extinction.

As well, the directors of remounting depots and above named horses, are bound to give the same information to the authorities of local police, when they are directed to take the necessary measures for the discovery and suppression of epizootics.

§ 4. The Chancellor of the Empire has charge of the execution of this law, and of the measures taken on its power.

When the epizooty appears in such a part of the territory of the empire, or in such an extent that it becomes necessary that

the measures taken be applied to the territories of several States of the Confederation, the Chancellor of the Empire, or an imperial commissioner named by him, will see that there is uniformity in the measures taken or to be taken by the authorities of the respective countries; he shall prescribe what is necessary to those effects, and shall give directly, if need be, to the authorities of the interested States, the instructions demanded by the circumstances.

§ 5. The authorities of the States of the Confederation are bound to lend each other mutual assistance in the execution of the measures having for object the prevention and suppression of epizootics.

I.

PREVENTIVE MEASURES AGAINST THE IMPORTATION OF EPIZOOTIES FROM FOREIGN COUNTRIES.

(a) *Restriction to the importation and circulation of animals.*

§ 6. The importation of animals affected with a contagious epizootic disease is prohibited.

§ 7. When in a foreign country a contagious epizooty exists or declares itself among domestic animals to an extent threatening for the animals of the interior:

1. The importation of living or dead animals of the foreign country where the epizooty exists, can be prohibited in a general way, either for some parts of the frontier, or it may be submitted to restrictions which stop or diminish the danger of the importation.

2. The circulation of animals in the zone of the frontier may be submitted to prescription likely to prevent the extension of a disease which might be imported.

The restrictions relating to the importation and circulation of animals shall, in the measure of need, also extend to the importation of animal matters, and of all other objects of contagion.

Communication shall be given immediately to the Chancellor of the Empire of all prescription, abrogation or modification of the restrictions placed on the importation and circulation of animals.

Restrictions relative to the importation and circulation of animals will be, without delay, made public.

(b) *Census of animals.*

§ 8. When the extension of epizooty in a neighboring country becomes threatening, a census may be ordered for the frontier zones, of animals which are there, as well as a regular control of the diminution or increase in the number of animals threatened with the epizooty.

II.

SUPPRESSION OF EPIZOOTIES IN THE INTERIOR OF THE COUNTRY.

1. General Precautions.

(a) *Obligatory declaration.*

§ 9. The owner of domestic animals is obliged to make immediately to the police authority the declaration of the eruptions amongst his stock, of one of the epizootic diseases named in §10, as well as of the suspicious signs making him fear the existence of such disease, and to keep the animal away from the places where there is danger from other animals to be contaminated.

These same obligations exist for the agent of said owner, and also in relation to the animals in transportation to those who have them in charge, and in relation to animals given in keep to other parties, to the owner of respective farms, stables, pastures, &c.

Are also obliged to make the same declaration the veterinary surgeons and all persons which professionally exercise veterinary medicine; as well as the inspectors of slaughter houses, as well as those whose profession is to remove, sell or work on animal cadavers or substances when, before the police have taken measures, they have knowledge of the eruption amongst animals of one of the following epizootic diseases or the apparition of suspicious signs.

§10. The epizootic diseases to which the obligatory declaration is applied are:

1st. Anthrax.

2d. Hydrophobia.

3d. Glanders and farcy of horses, donkeys, mules.

4th. Foot and month diseases of bovine, sheep, goats and swine.

5th. Pleuro-pneumonia of bovine.

6th. Small-pox in sheep.

7th. Maladie of coit (dourine) of horses and the coital exanthems of horses and bovines.

8th. Scabies of horses, donkeys, mules and sheep.

The Chancellor of the Empire is authorized to make also for other epizootic diseases the declarations transitorily obligatory.

§11. For the districts where anthrax exists permanently, the governments of the different States of the Confederation are authorized to take it off the obligatory declaration (§9) as long as the disease appears only on isolated cases. In this case the measures of prevention must be prescribed in a general manner and in accordance with the law and the extinction relating to its executions.

(b) *Measures to take to ascertain the existence of epizootic diseases.*

§12. When the declaration (§§ 9–10) has been made or that in any other manner, the existence, real or supposed, of a disease is known to the police authority, this will request the official veterinary surgeon to make the necessary inquiries to ascertain the existence of the disease. He will ascertain the nature, condition and causes of the disease, and will give his opinion as to whether it exists or the supposition of its presence is correct.

In urgent cases the veterinarian may, already before the action of the police, prescribe the sequestration and temporary quarantine of the sick and suspected animals, and if there is need, their inspection. The prescribed temporary measure will be made known to the owner of the animals, or his agent, either by a verbal or official written report, and which will immediately be given to the police.

At the request of the veterinarian the mayor (Vorsteher) of the place will organize the temporary infection of the diseased animals.

§ 13. When, from the opinion of the veterinary surgeon, it is possible to ascertain positively the existence of an epizootic disease

only by the autopsy of a suspected animal, the police authority can order the animal to be destroyed.

§ 14. Upon the declaration of veterinary surgeon that the epizootic disease exists, or that suspicion of its existence is founded, the police authority shall take and execute, as long as there will be danger, the measures of prevention required by the circumstances, and as directed by the present law and police regulations concerning it. If the police authority doubts the correctness of the declaration made by the veterinarian, it shall request the opinion of a superior veterinary authority without however not having the necessary precautions reinforced.

§ 15. When the eruption of foot and mouth disease shall have been established by the advice of the veterinarian, the police authorities may prescribe immediately the measures of precaution necessary after the declaration of new cases of disease as they appear in the infected locality or surroundings, without requesting to that effect another visit of the veterinarian.

As well, in the districts where anthrax exists permanently, it is not necessary to call upon the veterinary surgeon in each case of that epizooty.

§ 16. In all the cases where the veterinarian is called to ascertain the condition of a suspected animal, the owner of the animal shall be at liberty to also call a regular veterinarian to proceed to the investigation, the prescription of measures of prevention being nevertheless executed.

However, in the case of difference of opinion between the veterinarians, relating to the existence or suspicion of an epizootic disease, or in the case where for other reasons there are serious doubts as to the correctness of the data given by the official veterinarian, the authority shall at once request the opinion of a high veterinary authority, and will act according to his decision.

§ 17. All cattle and horse markets shall be inspected by official veterinarians. This measure may be applied also to animals collected in public or private places, to be sold at public sale, to male stock animals placed at the disposition of the people for breeding purposes, to public shows of animals, and to gatherings of horses and cattle requested by the authorities. The veter-

inary surgeon is obliged to report immediately to the police authority all cases of epizootic contagious diseases, as well as all suspicious symptoms he may have noticed at the market or amongst the animals above mentioned, and after carefully examining the nature of the case, to request the application of the necessary preventive measures of the police.

If there is danger imminent, the veterinarian is authorized to direct, already before the intervention of the police, the sequestration and isolation of diseased or suspected animals.

(c) *Preventive measures against the danger of epizootic diseases.*

§ 18. When there is danger of epizootic disease, and as long as this will last, the following preventive measures may, according to the cases, the character of the danger, and taking in consideration the interests of circulation, be prescribed by the police authorities, except the observations of the special prescription, established by the present law for some particular epizootic diseases.

The recourse formed by the owner against the preventive measures prescribed by the police authority has no suspensive effect.

§ 19. 1. Isolation, surveyance or observations by the police of disease or suspect animals.

The owner of an animal isolated or submitted to police observation, is obliged, if requested, to take such measures that during the isolation or observation, the animal cannot leave the place, stable, yard or pasture assigned for it, and that it will remain free from contact or community with other animals.

§ 20. 2. Restrictions in the mode of use, work or transport of diseased or suspected animals; of their products or objects which have been in contact with them or which, generally, are of nature to propagate the disease.

Restrictions for the transport of animals exposed to be contaminated, and of those which are of nature to propagate the disease.

§ 21. 3. The interdiction to bring to common pastures animals from different stables or sheds and to allow feeding in certain places selected afterwards; interdictions to bring animals to com-

mon wells or troughs, as well as to put them in connection with diseased or suspected animals upon public or common roads or pastures.

Interdiction to all dogs to run about.

§ 22. 4. Isolation or sequestration of the stable, shed or other place where diseased or suspected animals are, that of the farm, locality, pasture or suburbs of the town relatively to the circulation of animals and with objects of contagion.

Isolation of the farm, place, pasture or suburbs of the town, cannot be commanded unless the existence of the epizooty has been pronounced by the official veterinarians.

Isolation of a place or suburbs of a town cannot take place unless the disease presents by its nature, an important and general danger and unless a certain number of animals are already affected. Isolation can be limited to certain streets or parts of a town or suburbs. Isolation, by police authority, of a stable, shed, or other place where animals are, of a farm or pasture, obliges the owner to take all precautions which are required for its efficacious execution.

§ 23. 5. Inoculation of animals threatened by the epizooty, the veterinary attendance of diseased animals, as well as the restrictions belonging to the right of experiments for recovery.

Inoculation or veterinary attendance can not be ordered only in the cases indicated in the present law and according to its prescriptions of detail.

Inoculation ordered by the police shall be made under the survey of the official veterinarian or by himself.

§ 24–6. Slaughter of diseased or suspected animals.

Slaughter cannot be ordered except in cases expressly named in the present law.

The prescription of immediate slaughter of the diseased or suspected animals is not, where it is mentioned in the present law, to be applied when the animals are sent to a superior school under State survey, to be used as means of instruction.

§ 25. When animals, for the circulation and use of which restrictions exist or which are isolated, are used contrary to the interdiction or are found outside the place assigned to them or in

places prohibited to them, the police authority may order their immediate slaughter.

§ 26. The removal of cadavers, so that they should be harmless, of animals dead from the disease or slaughtered as having been sick or suspected, and that of parts of cadavers of said animals which are likely to propagate the disease (meat, skin, intestines, horns, hoofs, &c.), as well as the bedding, manure and all other objects coming from diseased or suspected animals.

§ 27. Disinfection of stables, sheds and other places where these animals were, and disinfection and useful suppression of the tools and other objects which have been in contact with those animals, particularly also the clothes of persons which have been in contact with diseased animals.

If judged useful, disinfection of persons who have been in contact with diseased animals may be ordered.

The execution of these measures shall take place, according to the orders of the official veterinarian and under the survey of the police authority.

§ 28. 9. Interdiction of cattle and horses from markets as well as from public shows of animals in the locality or its surroundings where the disease exists, or exclusion from markets of some species of animals.

§ 29. 10. Visits by the veterinarian of animals exposed to contagion, which are in the locality or surroundings where the disease exists.

(*To be Continued.*)

INFECTIOUS DISEASES.

BILL TO PREVENT THEIR INTRODUCTION AMONG DOMESTIC ANIMALS.

Mr. Williams introduced in the United States Senate, on Tuesday, a bill to prevent the introdution or dissemination of infectious diseases among domestic animals in the United States. The bill makes it unlawful to import or introduce into the United States

from foreign countries, or into any State or Territory, any animal affected with a communicative, infectious or contagious disease, except in accordance with the rules and regulations adopted by the National Board of Health, or those of any State or Territory made in pursuance of the bill. It prohibits the sale of domestic animals affected with contagious diseases, such as lung plague, pleuro-pneumonia of cattle, splenic or Texas cattle fever, foot and mouth disease, hog cholera, etc., in violation of the provisions of the bill; directs the National Board of Health or its Executive Committee to report to the President whenever any place in the United States is considered to be dangerously infected with an infectious disease of domestic animals, and upon public notice of such fact being given by the President the removal of such animals from such infected district is made unlawful, unless carried on in accordance with rules and regulations made by the National Board of Health.

The bill also authorizes the National Board of Health to investigate and report on diseases of animals prevailing in the United States or in countries from which the United States may import domestic animals for breeding or other purposes, and also to draft rules and regulations deemed necessary to arrest or prevent the spread of infectious diseases among domestic animals. It authorizes the National Board of Health to appoint veterinary surgeons, who shall be ex-officio members of the Board, together with other veterinary surgeons to act as inspectors.

To meet the expenses to be incurred in carrying out the provisions of the bill the sum of $1,000,000 is appropriated, to be dispensed under the direction of the Secretary of the Treasury on estimates made by the National Board of Health.—*Farmer's Magazine.*

PROVISIONS OF THE BILL ESTABLISHING A BUREAU OF ANIMAL INDUSTRY.

WASHINGTON, Jan. 28.—The bill reported to-day by Senator Johnston, from the select Committee on Contagious Diseases of Domestic Animals, provides that the Commissioner of Agriculture

shall organize a "Bureau of Animal Industry," and appoint as its chief some competent veterinary surgeon, approved by the National Board of Health, whose duty it shall be to collect and report all such information upon the subjects referred to as may be valuable to the agricultural and commercial interests of the country. For the purpose of investigation, and the prevention and cure of such diseases, he is authorized to call to his aid the National Board of Health, and to employ in addition to an agent in each State and Territory for the collection of local information, two Commissioners, one of whom shall be a practical stock-raiser, and one an experienced business man, familiar with questions pertaining to commercial transactions in live stock, whose duty it shall be to advise with regard to the best methods of treating, transporting, and caring for animals, and of providing against the spread of contagious diseases. The bill further provides that it "shall be the duty of the Commissioner of Agriculture, through the chief of the bureau, in connection with the National Board of Health, to prepare such rules and regulations as they may deem necessary for the speedy and effectual suppression and extirpation of said disease, and to certify such rules and regulations to the executive authority of each State and Territory, and whenever any State or Territory shall accept the same, then it shall be the further duty of the Commissioner of Agriculture, through the said chief of bureau, to assist in the execution of such rules and regulations." It is made the duty of the Secretary of the Treasury to establish quarantine stations at such points as may be necessary, and to "establish and carry into effect such regulations, consistent with State laws, as may be necessary to prevent the spread of said diseases by importations from abroad," and he is authorized to employ Customs officers and revenue vessels for these purposes. The bill further provides that "it shall be unlawful to import or introduce into the United States from foreign countries, or into one State or Territory from another, or to offer for sale, any domestic animal affected with contagious disease, or which has been presumably exposed thereto, except in accordance with the provisions of this act and the rules and regulations adopted in pursuance thereof." To meet the expenses

that may be incurred in carrying out its provisions, (including one for the reimbursement of the value of infected animals purchased and slaughtered in States or Territories accepting the proposed rules and regulations,) the bill appropriates $200,000 to be disbursed under the direction of the Commissioner of Agriculture. —*N. Y. Times.*

SOCIETY MEETINGS.

THE MONTREAL VETERINARY MEDICAL ASSOCIATION.

This Association held its regular fortnightly meeting in the lecture room of the Veterinary College on Thursday evening last, the President, Mr. C. J. Alloway, V. S., in the chair. A full attendance of members was present. At the close of the usual preliminary business, the chairman requested Mr. P. Paquin to describe his case. The reader said the subject of his communication was a case of tetanus, commonly called lock-jaw, in a horse which he treated last summer. He fully described the symptoms and mode of treatment, which consisted in small and repeated doses of chloral hydrate, under which the animal finally recovered. An interesting discussion followed, and the reader was complimented for his skill and success. The chairman next called upon Mr. Alexander Glass to communicate his case of purpura hæmorrhagica, which had been successfully treated at the College Hospital. Mr. Glass said his case was a mare which had been suffering from influenza during the late epizoötic outbreak, and that the purpura had followed as a sequel. He fully described the carefully-noted symptoms, together with the treatment, which consisted of one and a half ounces of ol terel made into a ball with a sufficiency of lina farina and repeated four times a day; she likewise got small quantities of ferrous sulphate, under which treatment she gradually recovered. In the discussion that followed all present approved of the treatment, and agreed that the marked beneficial effects of the remedies showed their efficacy in counteracting the destructive changes in the blood which are

characteristic of the disease. Mr. B. D. Pierce next introduced his paper on the subject of "Veterinary Dentistry." The essayist began by describing the formation, anatomy, mode of growth, &c., of the dental structure of the lower animals; he fully described the different malformations and diseases usually met with, especially those peculiar to the equine. He likewise alluded to the practice of dishonest dealers in filing down the incisor teeth of aged horses and then staining a black mark on their table surface with some chemical agent, so as to make them assume the appearance of a young mouth. This operation, he said, was commonly known by the name of "bishoping," and was one that could readily be detected by an experienced person. Mr. Pierce likewise drew the attention of the members present to the subject of dentistry, and thus protect the credulous public from imposition by men who style themselves veterinary dentists, the majority of whom are ignorant of the first principles of the anatomy, physiology, structure or functions of the organs they profess to treat. The reading was listened to with attention and followed by a lively discussion.

Mr. A. W. Clement proposed and Mr. C. Ormond seconded that Mr. W. Bell be admitted a member of the Association. Carried.

Mr. M. C. Baker, V.S., proposed, seconded by Dr. W. McEachran, a vote of thanks to the essayists. Carried.

At next meeting, February 3d, Mr. E. J. Carter will read a paper on "Counter Irritation," Mr. R. Price will communicate a case of "Influenza" and Mr. C. B. Robinson a case of "Nephritis".—*The Gazette* (*Montréal*).

BIBLIOGRAPHY.

Nouveau Dictionnaire pratique de Medecine, Chirurgie et Hygiene Veterinaires. (New Dictionary of Veterinary Medicine, Surgery and Hygiene.)

This most excellent work, started a number of years ago by M. H. Bouley and Reynal, the publication of which was so long in-

terrupted by uncontrollable circumstances, is to be continued, and its publication completed as soon as possible.

The authors, amongst whom figure the names of M. H. Bouley, A. Sanson, Trasbot, Nocard, P. Bouley, and others, are sufficient proof of the excellency of the work and of the thorough and masterly manner with which all articles will be written.

The eleventh volume has just been published, and amongst the treasures it contains we mention as those which would prove of immediate interest to American readers:

Jugular Vein—*Tongue* (anatomy, physiology, external forms, pathology)—*Larynx* (anatomy, physiology, external forms)—*Cartilaginous Quittor*, *Discharge* from the nose, *Keraphyllocele*, *Lampas*, *Cysts*, *Leucocythemia*, *Lactation*, *Milk*, *Jaundice*, *Measles in Pig*.

NEWS AND SUNDRIES.

VETERINARY COLLEGE FOR IRELAND.

Application has been made to the Lord Lieutenant of Ireland, by a deputation in which the absence of veterinarians was observed, to obtain authorization to establish a veterinary college in Dublin, for Ireland. The new venture, amongst special privileges, asks for a grant of £10,000 to start with, and it is said that even with this the school could not last more than two or three years. Application is also made for permission to grant their own licenses without being in connection with the Royal College in London. Much doubt is expressed as to its need, as also to its success.

FOOT AND MOUTH DISEASE IN ENGLAND AND IMPORTED TO AMERICA.

The *Veterinary Journal* says that it is a serious matter for reflection that foot and mouth disease has reappeared, after a

prolonged absence from the country, and is somewhat rapidly extending. Recent information says that a herd of two bulls and eight heifers, brought to America from London by the steamship "France," on being inspected by Dr. J. D. Hopkins, were found suffering with that disease.

EXCHANGES, ETC., RECEIVED.

HOME EXCHANGES.—Medical Record, Surgical Reporter, American Agriculturist, Scientific American, National Live Stock Journal, Country Gentleman, Turf, Field and Farm, Boston Cultivator.

FOREIGN EXCHANGES—Clinica Veterinaria, Recueil de Medecine Veterinaire, Archives Veterinaires, Journal de Zootechnie, Gazette Medicale, Revue d'Hygiene, Revue Dosimetrique, Veterinarian, Veterinary Journal, Revue fur Thierheilkunde und Thierzucht, Schweizeriches Archiv fur Thierheilkunde und Thierzucht, Archiv fur Wissenchaftliche und Practische Thierheilkunde, Repertorium der Thierheilkunde.

JOURNALS.—Maine Farmer, The Independent Practitioner, International Journal of Medicine and Surgery, Farm Journal, American Farmer, Farmers' Magazine, The Gazette (Montreal).

BOOKS.—(from Dr. Lanzilotti-Buonsanti) Gazette Medico-Veterinaria (5 vols.), Archivio di Medicino Veterinaria (3 vols.), Compendio di Anatomica Speciale del Dr. E. Sertoli, Compendio di Anatomica Descrittiva Veterinaria e Comparata del Dr. F. Zouoli, Trattato di Pathologia e Terrapia Chivurgica del Dr. Lanzilotti-Buonzanti. Contagious Diseases of Cattle, Report of C. P. Lyman, F.R.C.V.S.

COMMUNICATION.—A. A. HOLCOMBE.